

NEW ENGLAND NOTE

*DRABA GLABELLA* (BRASSICACEAE), NEW TO MAINE

ARTHUR HAINES

441 Dead River Road, Bowdoin, ME 04287

e-mail: arthurhaines@gwi.net

*Draba* L. is a large genus of low, annual to perennial herbs distributed nearly worldwide (Rollins 1993). Three species of native New England *Draba* form a morphologically and ecologically similar group—*D. arabisans* Michx., *D. breweri* S. Watson var. *cana* (Rydb.) Rollins, and *D. glabella* Pursh. All three species are perennials with a well-developed caudex and have reproductive stems with 3 or more leaves, basal leaves with stellate hairs, white petals, and compressed silicles (Mulligan 1976; Rollins 1993). They are inhabitants of high pH bedrock cliffs, talus slopes, and rocky woodlands. Further, within New England, all three species are restricted to northern states (i.e., Maine, New Hampshire, and Vermont; Seymour 1982). The species are often misidentified, in large part due to over-reliance on non-diagnostic characters in botanical manuals (see below). Herbarium surveys of regional museums for the Herbarium Recovery Project, administered by the New England Wild Flower Society, have altered the known distribution of *D. glabella* in New England. This note presents a new record for *D. glabella*, discusses excluded locations, and presents a regional key.

*Draba glabella* (synonyms: *D. daurica* DC.; *D. arabisans* var. *orthocarpa* Fernald & C. H. Knowlt.) is a circumpolar species that displays a wide range of morphologies in response to edaphic factors (Rollins 1993). It is closely related to *D. arabisans* and the two species have been combined (Boivin 1966). However, Mulligan (1970) presented morphological, geographical, and cytological evidence for recognition of both species. In New England, *D. glabella* has been previously reported only from Vermont (Seymour 1982).

Northern New England specimens of *Draba* from CONN, GH, HCOA, MAINE, MASS, NEBC, NHA, NUV, SMCW, and VT were critically examined using morphological characters stressed by Mulligan (1970, 1976; see below). A new location for *D. glabella* was discovered from Mount Kineo, Kineo Township, Maine. Identification of specimens from NEBC were confirmed by Ihsan Al-Shehbaz (Missouri Botanical Garden).

SPECIMEN CITATION: U.S.A. Maine: Piscataquis Co., Kineo Township, base of cliff at Mt. Kineo, *unknown collector s.n.* (MAINE); Mt. Kineo, base of cliff, 6 Jun, *F. Bunker s.n.* (MAINE); Mt. Kineo, on dry, calcareous ledges and soils, E cliff, growing with *Potentilla recta* and *Arabis glabra*, 20 Aug 1986, *S. Rooney, B. Bochan & G. Morse 101* (MAINE); Mt. Kineo, E face, moist calcareous ledges, with *Primula laurentiana* and *Carex capillaris*, 12 Jul 1992, *H. Hinds s.n.* (MAINE); Mt. Kineo, 21 Sep 1887, *G. Kennedy s.n.* (NEBC); Mt. Kineo, S lower cliffs, rock shelves, 31 Aug–1 Sep 1907, *J. Cushman 1894* (NEBC); Mt. Kineo, base of cliff, 1878, *M. Fernald s.n.* (MASS).

Mount Kineo is a small peak rising to 550 m elevation in central Maine. It occurs on an exposed peninsula extending out from the east shoreline of Moosehead Lake. Mount Kineo is well known for its northern and/or calciphilic flora, including *Agrostis mertensii* Trin., *Carex aurea* Nutt., *C. capillaris* L., *Clematis occidentalis* (Hornem.) DC., *Dryopteris fragrans* (L.) Schott, *Epilobium ciliatum* Raf. subsp. *ciliatum*, *Trisetum melicoides* (Michx.) Vasey ex Scribn., and the only known extant inland population of *Primula laurentiana* Fernald in New England. This list of species seems unusual given that the bedrock is Kineo Rhyolite, a flint-like volcanic rock that was laid down during violent eruptions of steam and ash (Caldwell 1998). Rhyolite, which has high silica content, would be expected to be a relatively acidic rock (George Kendrick, Woodlot Alternatives, Inc., pers. comm.). However, at Mount Kineo the rhyolite overlays the Tarratine Formation, a sandstone created during Devonian times with abundant fossils and, therefore, an ample supply of calcium (Caldwell 1998; Osberg et al. 1985). Mount Kineo has exposed cliffs on the south and east faces of the mountain. *Draba glabella* occurs there along the base of the cliffs, often in partial shade of *Thuja occidentalis* L.

Review of specimens in regional herbaria shows that *Draba glabella* and *D. arabisans* are frequently misidentified. Confusion between these two species is primarily due to use of non-diagnostic characters for determination. Fernald (1934, 1950), for example, utilized cauline leaf shape, pedicel thickness and length, and silique morphology, among other characters, to discriminate between *D. arabisans* and *D. glabella*. All of these characters overlap and do not lead to reliable identification of the species. Modern regional manuals emphasize flat versus twisted siliques as an important character (Gleason and Cronquist 1991; Magee and Ahles 1999). This character too cannot be used as a sole criterion for determination (specimens of *D. glabella* from Mount Kineo frequently have twisted fruits contrary to statements in modern manuals).

Mulligan (1970, 1976) stressed the importance of trichome morphology for separation of *Draba arabisans* and *D. glabella*. *Draba*

*arabisans* has sessile stellate hairs on the abaxial (i.e., lower) surfaces of the basal leaves. At 20× magnification, the radiating branches of the hairs can be seen to lie flat on the blade surface. *Draba glabella*, on the other hand, shows short-stalked stellate hairs on the abaxial surfaces of basal leaves. Viewed at magnification, the radiating branches of the hairs are elevated above the leaf surface. Comparative images of trichomes of *Draba* can be found in Mulligan (1976). Caution: poorly pressed specimens of *D. arabisans* in many instances appear to have stalked stellate hairs due to irregular drying and dimpling of the leaf surface (this artificially lifts the branches of the hairs above the blade surface). Be sure to view the trichomes at an angle parallel with the leaf surface to correctly determine the presence or absence of stalks.

Mulligan (1970, 1976) and Rollins (1993) also utilized style length as a diagnostic character for separation of *Draba arabisans* and *D. glabella*. Both authorities state in the identification keys that *D. arabisans* has styles longer than 0.25 mm and *D. glabella* has styles shorter than 0.25 mm. Review of New England collections indicates that style length, though useful, will not work for some plants (specimens of *D. glabella* from Maine and Vermont have styles up to 0.4 mm long).

Prior to the discovery of *Draba glabella* from northern Lake Champlain shoreline bluffs (e.g., Sunset Island, *P. Zika* 5165, VT; Providence Island, *P. Zika* 9185, VT), the species had previously been reported from Salisbury (Mt. Moosalamoo) and Westmore (Mt. Pisgah), Vermont, in New England (Dole 1937; Seymour 1982). These latter records were based on misidentified specimens of *D. arabisans* and were annotated as such during herbarium surveys for the Herbarium Recovery Project. The two specimens collected by Peter Zika were confirmed as *D. glabella* by Ihsan Al-Shehbaz (Missouri Botanical Garden). In summary, the verified New England distribution of *D. glabella* includes Grand Isle and Chittenden Counties, Vermont, and Piscataquis County, Maine.

#### KEY TO NEW ENGLAND *DRABA*

1. Petals bilobed with a deep, apical sinus; stems scapose (i.e., all the leaves confined to a basal cluster) . . . . . *D. verna*
1. Petals entire or emarginate at apex; stems with at least 1 leaf-bearing node . . . . . 2
  2. Plants annual; rachis of infructescence congested, 1–16 (–35) mm long; stem leaves all borne at base just above the basal rosette of leaves . . . . . *D. reptans*

2. Plants perennial from a caudex; rachis of infructescence relatively elongate, (16–) 20–78 mm long; stem leaves more evenly distributed, usually some produced in the apical half of the stem . . . . . 3
3. Lowest 1–3 flowers each subtended by a leafy bract; siliques pubescent with stellate hairs . . . . . *D. breweri*
3. None of the flowers subtended by leafy bracts; siliques glabrous or sparsely pubescent with simple or forked hairs . . . . . 4
4. Stellate hairs of abaxial surface of basal leaves borne on short stalks, the radiating branches of the hairs elevated above the surface of the leaf blade; styles up to 0.3 (–0.4) mm long; stigmas often bilobed . . . . . *D. glabella*
4. Stellate hairs of abaxial surface of basal leaves sessile, the radiating branches of the hairs appressed to the leaf surface; styles (0.3–) 0.4–1 mm long; stigmas scarcely bilobed . . . . . *D. arabisans*

ACKNOWLEDGMENTS. The following people and organizations assisted with the manuscript and are thanked: Dorothea Allard, Ihsan Al-Shehbaz, George Kendrick, New England Wild Flower Society, and Emily Wood.

#### LITERATURE CITED

- BOIVIN, B. 1966. Énumération des plantes du Canada. III. Herbicides, 1 partie: Digitatae: Dimerae, Liberae. *Naturaliste Canad.* 93: 583–646.
- CALDWELL, D. W. 1998. *Roadside Geology of Maine*. Mountain Press Publ. Co., Missoula, MT.
- DOLE, E. J., ed. 1937. *The Flora of Vermont*, 3rd rev. ed. Free Press Printing Co., Burlington, VT.
- FERNALD, M. L. 1934. *Draba* in temperate northeastern America. *Rhodora* 36: 241–261.
- . 1950. *Gray's Manual of Botany*, 8th ed. Von Nostrand Reinhold Co., New York.
- GLEASON, H. A. AND A. CRONQUIST. 1991. *Manual of Vascular Plants of Northeastern United States and Adjacent Canada*, 2nd ed. The New York Botanical Garden, Bronx, NY.
- MAGEE, D. AND H. A. AHLES. 1999. *Flora of the Northeast*. Univ. Massachusetts Press, Amherst, MA.
- MULLIGAN, G. A. 1970. Cytotaxonomic studies of *Draba glabella* and its close allies in Canada and Alaska. *Canad. J. Bot.* 48: 1431–1437.
- . 1976. The genus *Draba* in Canada and Alaska: Key and summary. *Canad. J. Bot.* 54: 1386–1393.

- OSBERG, P., A. HUSSEY, AND G. BOONE. 1985. Bedrock Geology Map of Maine. Maine Geological Survey, Augusta, ME.
- ROLLINS, R. C. 1993. The Cruciferae of Continental North America. Stanford Univ. Press, Stanford, CA.
- SEYMOUR, F. C. 1982. The Flora of New England. Phytologia Memoirs V, Plainfield, NJ.